PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Patent of:	
HAMPDEN-SMITH et al.	REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT FOR PTO MISTAKE (37 C.F.R. 1.322(a))
Patent No.: 7,476,411 B1	
Issued: January 13, 2009	
Confirmation No.: 4450	
Atty. File No.: 41890-00790	
For: "DIRECT-WRITE DEPOSITION OF PHOSPHOR POWDERS"	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is a request for a Certificate of Correction for PTO mistake under 37 C.F.R. 1.322(a). The errors in the patent are obvious typographical errors or omissions and the correct wording can be found in the original specification at Page 3, line 30, Page 14, line 19, and Page 51, line 29, or the Office Action dated August 12, 2002. Attached is form PTO 1050 in duplicate along with copies of documentation that unequivocally supports patentee's assertion(s).

Respectfully submitted,

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Date: January 29, 2009

Notice of References Cited	Application/Control No. 09/495,141	Applicant(s)/Patent Under Reexamination HAMPDEN-SMITH ET AL.	
	Examiner Brian K Talbot	Art Unit 1762	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,644,193 A	07-1997	Matsuda et al.	313/486
	B	US-6,197,218.B1	03-2001	Hampden-Smith et al.	252/301.36
	C	US-6,193,908 B1	02-2001	Hampden-Smith et al.	252/301.35
	D	US- 5932,139	08-1999	OShima et al.	252/301.16
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	11-46019	02-1999	Japan		
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

that secured articles can be easily produced using luminescent compositions that are not normally visible but are detectable using ultraviolet light or other means.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a process block diagram showing one embodiment of the process of the present invention.

Fig. 2 is a side view in cross section of one embodiment of aerosol generator of the present invention.

Fig. 3 is a top view of a transducer mounting plate showing a 49 transducer array for use in an aerosol generator of the present invention.

Fig. 4 is a top view of a transducer mounting plate for a 400 transducer array for use in an ultrasonic generator of the present invention.

Fig. 5 is a side view of the transducer mounting plate shown in Fig. 4.

Fig. 6 is a partial side view showing the profile of a single transducer mounting receptacle of the transducer mounting plate shown in Fig. 4.

Fig. 7 is a partial side view in cross-section showing an alternative embodiment for mounting an ultrasonic transducer.

Fig. 8 is a top view of a bottom retaining plate for retaining a separator for use in an aerosol generator of the present invention.

Fig. 9 is a top view of a liquid feed box having a bottom retaining plate to assist in retaining a separator for use in an aerosol generator of the present invention.

Fig. 10 is a side view of the liquid feed box shown in Fig. 9.

Fig. 11 is a side view of a gas tube for delivering gas within an aerosol generator of the present invention.

Fig. 12 shows a partial top view of gas tubes positioned in a liquid feed box for distributing gas relative to ultrasonic transducer positions for use in an aerosol generator of the present invention.

Fig. 13 shows one embodiment for a gas distribution configuration for the aerosol generator of the present invention.

Fig. 14 shows another embodiment for a gas distribution configuration for the aerosol generator of the present invention.

Fig. 15 is a top view of one embodiment of a gas distribution plate/gas tube assembly of the aerosol generator of the present invention.

to disperse more readily in a liquid suspension and impart advantageous flow characteristics to the suspension, particularly for deposition using a direct-write tool. For a given level of solids-loading, a liquid suspension of spherical particles will have a lower viscosity than a printing composition having non-spherical particles. Spherical particles are also less abrasive than jagged particles, reducing the amount of abrasion and wear on the direct-write tool.

In addition, the phosphor particles according to the present invention are substantially unagglomerated, that is, they include substantially no hard agglomerates of particles. Hard agglomerates are physically coalesced lumps of two or more particles that behave as one large particle. Agglomerates are disadvantageous for direct-write applications since large agglomerates can clog the orifice of the tool and can affect the minimum average line width that can be deposited with the tool. It is preferred that no more than about 1.0 weight percent of the phosphor particles of the present invention are in the form of hard agglomerates. More preferably, no more than about 0.5 weight percent of the phosphor particles are in the form of hard agglomerates.

A preferred method for forming the phosphor particles according to the present invention is to utilize a spray pyrolysis technique. A preferred spray pyrolysis technique is described in detail in U.S. Patent Application Serial No. 09/030,057, which is commonly owned with the present application and which is incorporated herein by reference in its entirety.

Generally, spray pyrolysis involves the generation of an aerosol of liquid precursors to the phosphor compound. Phosphor powders can be produced by spray pyrolysis that have high purity and a homogenous chemical composition. Preferably, the powders are produced in a substantially unagglomerated state without the necessity of a milling step to reduce primary particle size or agglomeration. Advantageously, the morphology of the particles can be controlled such that hollow and or porous particles can be produced as well as substantially dense particles.

Spray pyrolysis includes atomizing the precursor solution to form droplets, preferably with an ultrasonic atomizer. The droplets are then passed through a hot-wall reactor, such as a tubular furnace, in which the solvent evaporates and the precursors react to form the desired phosphor compound. The particles are then collected, for example in a heated filter. The average particle size can be tightly controlled by adjusting process parameters such as the concentration of precursor in solution and the frequency of the ultrasonic

deposition technique. However, the method of the present invention wherein fine phosphor particles are deposited using a direct-write tool, can be used to form the layer at a reduced cost. It is particularly advantageous to form a TFEL device by incorporating soluble molecular precursors into the liquid vehicle, as is discussed above. Thus, a phosphor compound particle in a liquid vehicle including precursors to the phosphor compound can be deposited using a direct-write tool. Preferred phosphor compounds for TFEL applications include ZnS:Cu, $SrGa_2S_4$:Ce or Eu and SrS:Cu.

The method of the present invention is also applicable to electroluminescent lamps. Electroluminescent lamps are formed on a rigid or flexible substrate, such as a polymer substrate, and are commonly used as back lights for membrane switches, cellular phones, watches, personal digital assistance and the like. A simple electroluminescent lamp is schematically illustrated in Fig. 39. The device 1140 includes a phosphor powder/polymer composite 1142 sandwiched between two electrodes 1144 and 1146, the front electrode 1144 being transparent. The composite layer 1142 includes phosphor particles 1148 dispersed in a polymer matrix 1150. Electroluminescent lamps can also be formed on rigid substrates, such as stainless steel, for use in highway signage and similar devices. The methodology according to the present invention can be used to form discrete patterns of such phosphor powders in electroluminescent lamps such as for text or aesthetic purposes.

The present invention is also applicable to flat panel displays. Flat panel displays offer many advantages over CRTs including lighter weight, portability and decreased power requirements. One type of flat panel display is a field emission display (FED). These devices advantageously eliminate the size, weight and power consumption problems of CRT's while maintaining comparable image quality, and therefore are particularly useful for portable electronics, such as for laptop computers. FED's generate electrons from millions of cold microtip emitters with low power emission that are arranged in a matrix addressed array with several thousand tip emitters allocated to each pixel in the display. The microtip emitters are typically located approximately 0.2 millimeter from a cathodoluminescent phosphor screen which generates the display image. This allows for a thin, light-weight display.

Fig. 40 illustrates a high-magnification, schematic cross-section of an FED device according to an embodiment of the present invention. The FED device 1080 includes a plurality of microtip emitters 1082 mounted on a cathode 1084 which is attached to a

PTO/SB/44 (04-05)
Approved for use through 04/30/2007. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,476,411 B1

APPLICATION NO.: 09/495,141

ISSUE DATE : January 13, 2009

INVENTOR(S) : HAMPDEN-SMITH et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title Page, (56) References Cited, insert:
--5,644,193 A 7/1997 Matsuda et al. 313/486
5,932,139 A 8/1999 Oshima et al. 252/301.16
6,193,908 B1 2/2001 Hampden-Smith et al. 252/301.35
6,197,218 B1 3/2001 Hampden-Smith et al. 252/301.36--

Column 3, line 17, delete "an other" and insert therefor --another--.
Column 10, line 26, delete "tis" and insert therefor --its--.
Column 36, line 54, delete "cathoduluminescent" and insert therefor --cathodoluminescent--.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

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